



UNIVERSITY  
OF MALAYA



NEWSLETTER

## Eco-Greenergy™ Self-Sustained Outdoor Lighting with Mosquito Trap and Flood Emergency Warning Transmission



This research project entitled 'Eco-Greenergy™ Self-Sustained Outdoor Lighting with Mosquito Trap and Flood Emergency Warning Transmission System' is led by Associate Professor Dr. Chong Wen Tong.

His team presented an innovative design of a self-sustained hybrid outdoor lighting & charging system with mosquito trap and flood emergency warning transmission system. The system comprises of the omni-direction-guide-vane (ODGV) integrated with vertical axis wind turbine (VAWT), solar photovoltaic panel, mosquito trap, buoy and laser distance sensor to measure the depth of water and send emergency signal.

This system is independent and powered by solar and wind energy. The power generated by the system is higher compared to other similar products due to the novel ODGV and orientation of solar panel mounting. During flood, when electricity supply is cut-off for safety reasons, the product could generate sufficient energy to light-up the

surrounding area by complimenting the energy from wind and solar. The battery storage, controller and wiring system are placed at the top compartment of the product, so that it can still function even water level raises to 4 meters in the current design. (The maximum allowable water level depends on the pole height). In addition, a sensor can be integrated and hidden inside the hollow section of the pole (to prevent vandalism) to detect the flood water level and transmit warning signal to search-and-rescue centres. Excess power generated by the system can be used to operate mosquito trap that integrated to the pole.



This outdoor lighting system has been pilot tested in the main campus of UM. Following its testing success, Dr. Chong's team is currently working with commercial partner to market the product. Meanwhile the team is working with researchers from the Department of Parasitology (UM) to evaluate the performance of the mosquito

trap that incorporated into the lamp post.



### Awards

#### Best Award

International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) 2015

#### Gold

International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) 2015

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## A Synthesis of Novel Eutectic Solvents and Their Applications in Biofuel, Nanotechnology and Gas Dehydration



The new generations of non-conventional solvents are deep eutectic solvents (DES) which have recently received intense interest due to their potential as environmentally benign solvents and their unusual solvation properties.

DES is a mixture of two or more compounds which has a melting point lower than that of either of its components. They are liquids at temperatures of 100 °C or below and exhibit similar solvent properties to the conventional ionic liquids (ILs). They comprise mixtures of organic halide salts, such as choline chloride with an organic compound which is a hydrogen bond donor (HBD) capable of forming a hydrogen bond with the halide ion, such as amides, amines, alcohols, carboxylic acids and many more. The liquid state of DES is produced through freezing point depression, whereby hydrogen-bonding interactions between an anion and a HBD are more energetically favored relative to the lattice energies of the pure constituents. DESs have several advantages over traditional ILs in that they are easy to prepare

in a pure state. They are nonreactive with water. Furthermore, toxicological properties of the components used for DES have been determined and are available, with some DES being biodegradable.

In this innovation, deep eutectic solvents (DESs) are used to produce high quality biodiesel and glycerol from low grade palm oil. Malaysia, being the world's largest palm oil producer and exporter will benefit from this invention. The results showed that DESs has high catalytic activity and therefore it can be applied to different types of reactions. As an example, DESs were applied as functionalizing agents for carbon nanomaterials such as carbon nanotubes, carbon nanofiber and activated carbon. It was found that DESs improved the surface of these materials. The functionalized nanomaterials can be applied in waste water treatment and sensor applications. DESs can also be used for dehydration of natural gas to replace the conventional solvents such as triethylene glycol. It was found that DESs can enhance the water uptake from humid gases. Salts in DESs play a very significant role in improving the properties of this new generation of solvents. Hence, DESs have promising future for other industrial applications.

### Award

#### Gold

International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) 2015

### Contact

#### Research Team

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## CHIEF - Connected Healthcare Integrated Fitness Solution



to provide feedback and advice to the user through the app.

CHIEF offers users an affordable and convenient method to reach a wide network of professionals. The mobile app gathers all the relevant health and fitness metrics of the user continuously 24/7 into one accurate and comprehensive report that can be viewed by health professionals for feedback and advice to formulate a proper fitness plan for their needs. This **"Supportive Accountability Framework"** encourages closer relationship between users and health professionals for a constant and sustained behavioral adjustment.



We also incorporated the Corporate Fitness Coaching Program (Fat2Fit) to make Corporate Fitness and Health easy, fun and engaging. The workplace organizational culture and environment have powerful influences on behaviour and can be leveraged to assist employees to adopt a healthier lifestyle. A corporate fitness program can cultivate employee bonding and

cooperation. Employees will benefit from the company-sponsored program not only in terms of health and fitness, but also in fostering closer relationships between colleagues. Employers can benefit from their employees' improved moral and productivity through reduced sick leave.

Current fitness apps rely on user's personal motivation and exercise regime towards achieving fitness. Often the user does not achieve the goal due to lack of self-motivation or not applying proper diet or exercise techniques. In addition, it is costly to engage services of a personal trainer and moreover the engagement only available during the exercise sessions.

The technology is a mobile solution for managing a healthy lifestyle through systematic tracking of user's activities. We innovated CHIEF based on the concept to create a need and motivate users to continuously engage in long term behavioural change. The CHIEF is unique as it allows users to track their overall health score as an aggregate of four metrics: Physical Activity, Diet, Body & Mental Activity.

The history logs of all four metrics are stored in the mobile device and uploaded to the cloud. The metrics can be viewed by approved health professionals who would be able

### Our Key Team

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Reebok



### Award

#### Gold

International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) 2015

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## Book Spot! Personalized Information Retrieval



Learning is enhanced when its activities are aligned with learning style. An integral component of students' learning activities is searching and retrieving reading materials.

However, it is not easy to find suitable reading materials that match students' needs. This is because most search engines are built with only content in mind. Identifying learning style and matching reading material based on learning style is critical for students as it may affect their learning progress and their rate of absorbing information. Thus, Book Spot! is developed as an online system to aid students to seek for reading material that best matches their learning style in order to optimize their progress.

Book Spot! is an extension of learning style based on Information Seeking Tool. The development of this tool requires the reading materials to be classified based on learning style preferences. Primitive elements, such as text, graphs, and diagrams, have been chosen as identifiers for

the above-mentioned classification. The classified primitive elements in reading material are then mapped onto learning style preference. Content from reading material is extracted and calculated using Feature Extraction algorithm. To match students towards appropriate reading material based on their learning style preference, classification model is used. Book Spot! uses hybrid recommender method; knowledge based and collaborative filtering method to recommend reading materials for students.

The highly customizable Book Spot! represents significant contribution towards online information retrieval application and it is able to serve as a vital component on popular search engine. In social aspect perspective, Book Spot! assists student in improving their readership and shortens the information seeking time and it also assists teacher/lecturer/tutor in preparing reading material for teaching. With Book Spot!, students are able to locate reading material effectively and efficiently while minimizing the risks of impairing learning progress by selecting inappropriate reading material.

In addition to the PENCIPTA 2015 gold award, Book Spot! has been recognized in several other competitions as listed below:

- Gold Medal, World Invention Innovation Contest (WiC), Seoul, Korea, 2015.

- Gold Medal, Invention, Innovation & Design Exhibition, UiTM Shah Alam, Selangor, Malaysia, 2015.
- Gold, International Engineering Invention & Innovation Exhibition (i-ENVEX), Unimap, 2015.
- Best Award and Gold Medal, International Innovation, Design and Articulation, UiTM Perlis, 2014.
- Gold, Conference, Competition and Exhibition, Politeknik Seberang Perai, Pulau Pinang, 2014.
- Gold, EUREKA Innovation Exhibition, Universiti Kuala Lumpur Malaysian Spanish Institute, 2014.

### Award

#### Gold

International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) 2015

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## Eco-Photocatalytic System: Paves the Way for Efficiency Converting CO<sub>2</sub> to Methanol from Sunlight



into useful chemical. In this invention, a new photoreactor design coupled with an active photocatalyst has successfully converted CO<sub>2</sub> into methanol. Global demand of methanol is 60.7 million metric tons which worth at USD 24.9 billion. The creativity is to design a spaced thread profile which enables CO<sub>2</sub> and water vapour to swirl helically along the rod that coated with new type of photocatalyst.

compared to that from conventional energy intensive reactor.

### Award

#### Silver

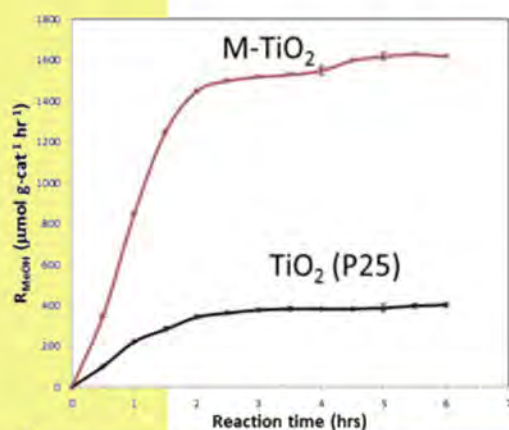
International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA) 2015

#### Contact

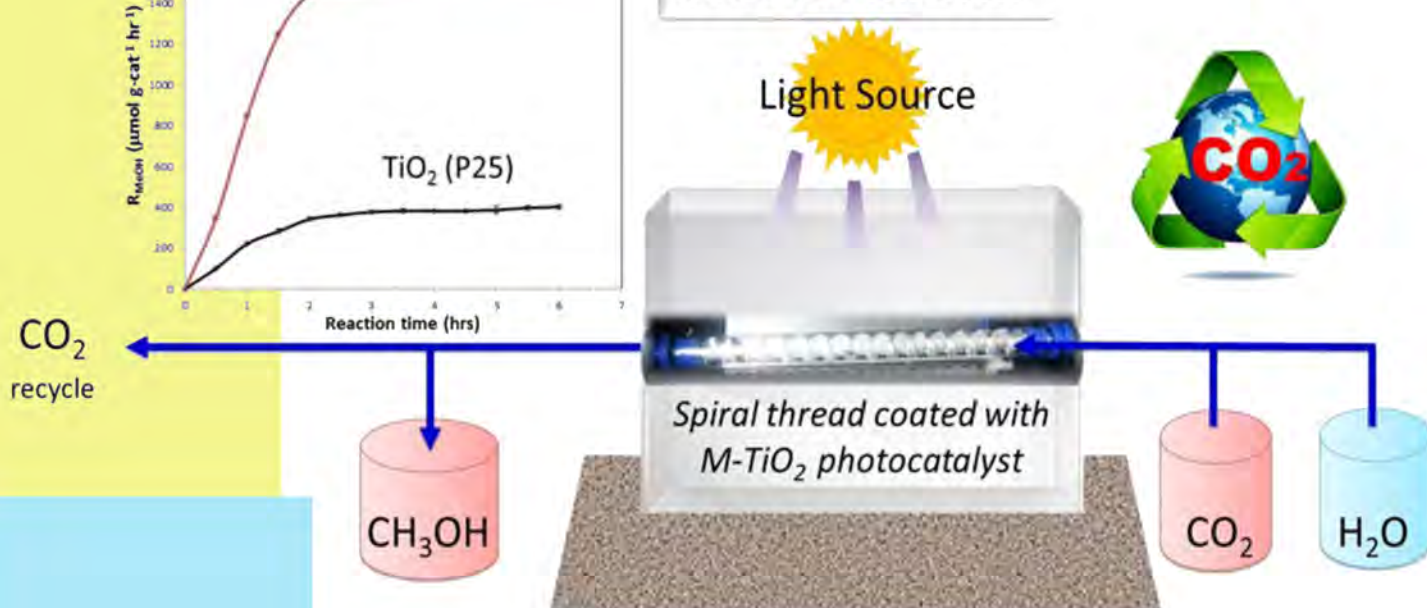
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The present invention relates to a gas conversion photoreactor which is preferably enclosed in a gas converter that substantially converts carbon dioxide (CO<sub>2</sub>) and water vapour into methanol with a light source. Since CO<sub>2</sub> is a very potent green house gas, it is desirable to transform CO<sub>2</sub>

Thereby this will increase the surface area of contact between the reacting gas and the photocatalytic coated rod. This system also enables a direct conversion of CO<sub>2</sub> under solar light. Methanol that produced from the Eco-Photocatalytic System is more economical



### Photoreactor



**EcoMethanol**



## CITra Wins Award at the MOHE Innovation Day 2015

CITra (Centre for the Initiation of Talent and Industrial Training) a.k.a. SKET (Section for Co-curriculum, External Faculty Electives and TITAS) submitted an entry for the MOHE Innovation Award 2015 competition under the category of Social Innovation with a project entitled "Social Innovation – The University-Community Engagement (UCE) Programme within Credited Co-curriculum Courses". The entry was judged by a panel of jury that consisted of members of the *Majlis Profesor Negara* and CITra secured 2nd place. The judging was based on these criteria: value of the problem, evidence of social change, creativity, replicability, significance or impact, cost-effectiveness and management commitment.

involving 1,200 students and approximately 500 people of five traditional *kampungs* within the district of Wangsa Maju.



Social innovation creates value for all actors within this 'creative alliance'; stakeholders of the wider community and members of the higher education institution. It mobilises knowledge, talent and investment in an inostensible but 'magical' way. In this particular event, people of the community felt empowered hosting the programme besides imparting local knowledge and teaching students how to play simple games such as *batu seremban* or *tarik upih*. On the part of the students, it took away their anti-social and virtual world, the result of smart-phones and video-games to the reality of living in traditional villages and connecting with people, thoroughly embracing new ways of learning, new-found skills, engaging in 'learning by doing' and experiential learning. Students developed sustainable interpersonal skills via real people interaction.

UCE embedded in co-curriculum

courses has not only successfully displaced performance-based education and the drudgery of exams and rote-learning, it has also reconfigured the University of Malaya relationship with its stakeholders and has enhanced public trust and confidence.



Social innovation is defined as 'the generation of new ideas about how people should organize interpersonal activities, or social interactions, to meet a common goal.' In relation to this, CITra organized a UCE Programme [April-May 2015] with the theme 'Reigniting Traditional Games'

### Award

#### 2nd Place

Ministry of Higher Education  
Innovation Awards Day 2015

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## HIGHLIGHT OF THE PRESS !

### Malaysia Technology Expo (MTE) 2016 Award Winners

Name of Researchers	Project Title	Faculties / Centres	Awards
<b>Dr. Ramesh Kasi,</b> Dr. Mohammad Hassan Khanmirzaei, Prof. Dr. Ramesh T. Subramaniam, Dr. Vengadaesvaran Balakrishnan, Mr. Ng Hon Ming, Mr. Mohd Zieauddin Kufian & Prof. Dr. Abdul Kariem Arof	BioPE-DSSC: Biopolymer Electrolyte Based Dye-Sensitized Solar Cells as Green Energy Source	Center for Ionics University Malaya (C.I.U.M), Department of Physics, Faculty of Science	Gold & The Best Award
<b>Ir. Dr. Lai Khin Wee,</b> Assoc. Ir. Dr. Belinda Murphy, Dr. Goh Siew Li, Yong Ching Wai, Victor Kean Shern Phng & Haw Yu Hong	OsteoKnee™	Department of Biomedical Engineering, Faculty of Engineering	Gold & The INNOPA Special Award (Indonesian Invention and Promotion Association)
<b>Prof. Dato' Dr. Mohd Jamil Maah,</b> Prof. Dr. Yusoff Mohd Amin, Dr. Siti Fairus Abdul Sani, Dr. Alawiah Ariffin, Siti Shafiqah Ahmad Shaharuddin, Prof. Dr. Hairul Azhar Abdul Rashid & Dr. Nizam Tamchek	Germanium Flat Fiber Dosimetry: a new intelligent material for radiation detection and measurement forming a highly versatile wide-spectrum detector of unsurpassed capability	Department of Chemistry, Faculty of Science	Gold
<b>Dr. Noor Azizi Mardî,</b> Dr. Ahmed Aly Dîaa Mohammed Sarhan, Prof. Dr. Hamdi Abdul Shukor, Javad Akhbari, Dr. Mohammad Reza Movahhedy, Seyed Reza Besharati Abdul Hadi Jalaludin, Dr. Mohd Sayuti AB Karim & Wan Nur Izzati Wan Badiuzaman	Development of A New CNC Gantry Machine with Double Motion Feed Drive System	AMMP Research Centre, Department of Mechanical Engineering, Faculty of Engineering	Gold
<b>Dr. Azuddin Mamat,</b> Prof. Dr. Imtiaz Ahmed Choudhury, Prof. Dr. Zahari Taha & Dr. Yap Hwa Jen	Portable modular electrical discharge machine (EDM) for micro application	Department of Mechanical Engineering, Faculty of Engineering	Gold
<b>Prof. Dr. Ramesh T. Subramaniam,</b> Prof. Dr. Abdul Kariem Arof, Dr. Ramesh Kasi, Ms. R. Shanti Rajantharan, Mr. Ng Hon Ming, Mr. Mohd Zieauddin Kufian, Dr. Vengadaesvaran Balakrishnan, Dr. Ezra Morris Abraham Gnanamuthu, Dr. Chee Swee Yong, Dr. Mohamad Hassan Khanmirzaei & Prof. Dr. Ramesh Singh	SmartDhesionPE: Smart Adhesion Polymer Electrolyte for Electrical Energy Development.	Center for Ionics University Malaya (C.I.U.M) Department of Physics, Faculty of Science	Gold



## HIGHTLIGHT OF THE PRESS !

### Malaysia Technology Expo (MTE) 2016 Award Winners

Name of Researchers	Project Title	Faculties / Centres	Awards
<b>Prof. Dr. Sulaiman Wadi Harun</b> , Prof. Dr. Harith Ahmad, Mr. Mohamad Badrol Hisyam Mr. Mahyuddin, Anas Abdul Latiff & Ir. Hanafiah Shamsuddin	CAHAYA: 2 Micron Q-Switched Fiber Laser	Department of Electrical Engineering, Faculty of Engineering	Silver
<b>Assoc. Prof. Dr. Chong Wen Tong</b> , Prof. Dr. Masjuki Haji Hassan, Dr. Chan Chee Seng Assoc. Prof. Dr. Ngoh Gek Cheng, Dr. Tey Kok Soon Mr. Wong Kok Hoe, Mr. Alireza Esmailzadeh, Mr. Ahmad Fazlizan Abdullah, Mr. Mohammed Gwani & Mr. Wan Khairul Muzammil Abd Rahim	Smart Outdoor Lighting System with Emergency Beacon, Flood Warning Transmission System and Security Camera	Department of Mechanical Engineering, Faculty of Engineering	Silver
<b>Prof. Dr. Misni Bin Misran</b> , Prof Dr. Hapipah Mohd Ali, Prof Dr. Mahmood Ameen Abdulla & Dr. Maryam Hajrezaei	Acceleration of wound healing potential by salicylic acid loaded lipid nanoparticles	Department of Chemistry, Faculty of Science	Silver
<b>Prof. Dr. Mohd Ali Hashim</b> , Dr. Maan Hayyan, Dr. Adeeb Hayyan & Eng. Muna Hassan Ibrahim	A Novel Desulphurization Method Using In-Situ Generated Superoxide Ion in Ionic Liquids	University of Malaya Centre for Ionic Liquids (UMCIL)  Department of Chemical Engineering, Faculty of Engineering  Department of Civil Engineering, Faculty of Engineering	Bronze
<b>Dr. Meldi Suhatri</b> , Seyyed Saghar Ghodsi, Mohammad Hossein Mehrabi & Hamed Khatibi	A Dual function anti vibration system (Chevron Viscoelastic Damper, CVD) for Vibration response	Department of Civil Engineering, Faculty of Engineering	Bronze
<b>Nur Azah Hamzaid</b> , Farahiyah Jasni, Nur Hidayah Mohd Yusof, Anur Diyana Abu Bakar, Hanie Nadia Shasmin & Zafirah Zakaria	mySMART Leg : In-socket Sensory System	Department of Biomedical Engineering, Faculty of Engineering	Bronze